Honors Algebra 2 Name_____

3.2 Factor using Identities & Guessing P/Q

Date_____

Factor each.

1) $x^3 - 1 = 0$

2) $x^3 + 64 = 0$

3) $x^4 - 27x = 0$

4) $x^3 - 125 = 0$

5) $x^7 - 64x = 0$

6) $x^3 + 27 = 0$

7) $x^3 - 8 = 0$

8) $x^3 - 64 = 0$

9) $x^3 + 8 = 0$

10) $x^3 + 1 = 0$

11) $x^7 - x = 0$

12) $x^3 + 125 = 0$

State the possible number of positive and negative roots for each equation. Then factor each.

13) $x^4 - 13x^3 - x^2 + 13x = 0$

14) $x^4 + 7x^3 - x^2 - 7x = 0$

15) $x^4 + 5x^3 - x^2 - 5x = 0$

16) $x^4 - 3x^3 - 9x^2 - 5x = 0$

17) $x^4 + 13x^3 - x^2 - 13x = 0$

18) $x^4 - 9x^3 + 15x^2 - 7x = 0$

19) $x^4 - x^3 - 5x^2 - 3x = 0$

20) $x^4 - 15x^3 + 27x^2 - 13x = 0$

21) $x^4 - 7x^3 - x^2 + 7x = 0$

22) $x^4 + 4x^3 + 5x^2 + 2x = 0$

23) $x^4 + 14x^3 + 13x^2 = 0$

24) $x^4 - 3x^2 + 2x = 0$

State the possible number of positive and negative roots and the possible rational roots for each equation. Then factor each.

25) $x^6 + x^4 - 25x^2 - 25 = 0$

26) $x^6 - 3x^4 - 16x^2 + 48 = 0$

27) $x^6 - 2x^4 - 4x^2 + 8 = 0$

28) $x^6 - 28x^3 + 27 = 0$

29) $x^6 - 26x^3 - 27 = 0$

30) $x^6 - 64 = 0$

31) $x^6 + 7x^3 - 8 = 0$

32) $x^6 + 4x^4 - 9x^2 - 36 = 0$

33) $x^6 + 5x^4 - 4x^2 - 20 = 0$

34) $x^6 + 2x^4 - 9x^2 - 18 = 0$

35) $x^6 - 1 = 0$

36) $x^6 + x^4 - 16x^2 - 16 = 0$

Answers to 3.2 Factor using Identities & Guessing P/Q

1) $(x-1)(x^2+x+1)=0$
2) $(x+4)(x^2-4x+16)=0$
3) $x(x-3)(x^2+3x+9)=0$
4) $(x-5)(x^2+5x+25)=0$
5) $x(x-2)(x^2+2x+4)(x+2)(x^2-2x+4)=0$
6) $(x+3)(x^2-3x+9)=0$
7) $(x-2)(x^2+2x+4)=0$
8) $(x-4)(x^2+4x+16)=0$
9) $(x+2)(x^2-2x+4)=0$
10) $(x+1)(x^2-x+1)=0$
11) $x(x-1)(x^2+x+1)(x+1)(x^2-x+1)=0$
12) $(x+5)(x^2-5x+25)=0$
13) Possible # positive real roots: 2 or 0
Possible # negative real roots: 1
Factors to: $x(x-13)(x+1)(x-1)=0$
14) Possible # positive real roots: 1
Possible # negative real roots: 2 or 0
Factors to: $x(x+7)(x+1)(x-1)=0$
15) Possible # positive real roots: 1
Possible # negative real roots: 2 or 0
Factors to: $x(x+5)(x+1)(x-1)=0$
16) Possible # positive real roots: 1
Possible # negative real roots: 2 or 0
Factors to: $x(x+1)^2(x-5)=0$
17) Possible # positive real roots: 1
Possible # negative real roots: 2 or 0
Factors to: $x(x+13)(x+1)(x-1)=0$
18) Possible # positive real roots: 3 or 1
Possible # negative real roots: 0
Factors to: $x(x-1)^2(x-7)=0$
19) Possible # positive real roots: 1
Possible # negative real roots: 2 or 0
Factors to: $x(x+1)^2(x-3)=0$
20) Possible # positive real roots: 3 or 1
Possible # negative real roots: 0
Factors to: $x(x-1)^2(x-13)=0$
21) Possible # positive real roots: 2 or 0
Possible # negative real roots: 1
Factors to: $x(x-7)(x+1)(x-1)=0$
22) Possible # positive real roots: 0
Possible # negative real roots: 3 or 1
Factors to: $x(x+2)(x+1)^2=0$
23) Possible # positive real roots: 0
Possible # negative real roots: 2 or 0
Factors to: $x^2(x+13)(x+1)=0$
24) Possible # positive real roots: 2 or 0
Possible # negative real roots: 1
Factors to: $x(x+2)(x-1)^2=0$
25) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots: $\pm 1, \pm 5, \pm 25$
Factors to: $(x^2+1)(x^2-5)(x^2+5)=0$
26) Possible # positive real roots: 2 or 0
Possible # negative real roots: 2 or 0
Possible rational roots:
$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 16, \pm 24, \pm 48$
Factors to: $(x^2-3)(x-2)(x+2)(x^2+4)=0$
27) Possible # positive real roots: 2 or 0
Possible # negative real roots: 2 or 0
Possible rational roots: $\pm 1, \pm 2, \pm 4, \pm 8$
Factors to: $(x^2-2)^2(x^2+2)=0$
28) Possible # positive real roots: 2 or 0
Possible # negative real roots: 0
Possible rational roots: $\pm 1, \pm 3, \pm 9, \pm 27$
Factors to: $(x-1)(x^2+x+1)(x-3)(x^2+3x+9)=0$
29) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots: $\pm 1, \pm 3, \pm 9, \pm 27$
Factors to: $(x-3)(x^2+3x+9)(x+1)(x^2-x+1)=0$
30) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots:
$\pm 1, \pm 2, \pm 4, \pm 8, \pm 16, \pm 32, \pm 64$
Factors to: $(x-2)(x^2+2x+4)(x+2)(x^2-2x+4)=0$
31) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots: $\pm 1, \pm 2, \pm 4, \pm 8$
Factors to: $(x-1)(x^2+x+1)(x+2)(x^2-2x+4)=0$

32) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots:
$\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 9, \pm 12, \pm 18, \pm 36$
Factors to: $(x^2 + 4)(x^2 - 3)(x^2 + 3) = 0$

33) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots:
$\pm 1, \pm 2, \pm 4, \pm 5, \pm 10, \pm 20$
Factors to: $(x^2 + 5)(x^2 - 2)(x^2 + 2) = 0$

34) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots:
$\pm 1, \pm 2, \pm 3, \pm 6, \pm 9, \pm 18$
Factors to: $(x^2 + 2)(x^2 - 3)(x^2 + 3) = 0$

35) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots: ± 1
Factors to: $(x - 1)(x^2 + x + 1)(x + 1)(x^2 - x + 1) = 0$

36) Possible # positive real roots: 1
Possible # negative real roots: 1
Possible rational roots: $\pm 1, \pm 2, \pm 4, \pm 8, \pm 16$
Factors to: $(x^2 + 1)(x - 2)(x + 2)(x^2 + 4) = 0$